



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Log R-1112A

Date: July 14, 1989

In Reply refer to: R-89-45 through -51

Ms. Susan Coughlin
Acting Administrator
Federal Railroad Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

About 11:44 a.m. central daylight savings time on July 30, 1988, Iowa Interstate Railroad Ltd. (IAIS) freight trains Extra 470 West and Extra 406 East collided head on within the yard limits of Altoona, Iowa, about 10 miles east of Des Moines, Iowa. All 5 locomotive units from both trains; 11 cars of Extra 406 East; and 3 cars, including 2 tank cars containing denatured alcohol, of Extra 470 West derailed. The denatured alcohol, which was released through the pressure relief valves and the manway domes of the two derailed tank cars, was ignited by the fire resulting from the collision of the locomotives. Both crewmembers of Extra 470 West were fatally injured; the two crewmembers of Extra 406 East were only slightly injured. The estimated damage (including lading) as a result of this accident exceeded \$1 million.¹

The IAIS was operating a "dark" (nonsignaled) territory, and apparently had authority to do so for the area in which the accident occurred, but had never been formally informed of this by the Federal Railroad Administration (FRA). While the FRA has a process in place for granting authority to discontinue the use of signal systems and was implemented with the CNW and the Iowa Railroad, there were deficiencies in the FRA's communication with the IAIS that did not reflect the status of authorities previously granted. After granting authority to the IAIS to operate without use of the signal system only on a temporary basis, the FRA failed to follow up with the IAIS to determine the status of the IAIS' request regarding use of the signal system. On-site inspection of IAIS operations by FRA personnel should have indicated readily that the IAIS was not operating with a signal system. The Safety Board believes that the FRA should reevaluate and resolve the status of block signal applications for the IAIS based on the current operations which now include two daily through trains, several local trains, consists

¹For more detailed information, read Railroad Accident Report--"Head-on Collision Between Iowa Interstate Railroad Extra 470 West and Extra 406 East with Release of Hazardous Materials near Altoona, Iowa on July 30, 1988" (NTSB/RAR-89/04).

which include hazardous materials, and the operation of passenger excursions.

The provisions of 49 CFR Part 217 outline the FRA's requirements for railroads (1) to file a copy of its operating rules, timetables, and special instructions, (2) to file a program for conducting operational tests and inspections to determine compliance with operating rules, and (3) to file a program of instruction on operating rules. Based on information received during a meeting with FRA personnel on September 7, 1988, and in a letter dated January 18, 1989, the IAIS was not in compliance with the provisions of 49 CFR 217 and had not been granted an exemption or waiver from these provisions. On September 2, 1987, at Blue Island, Illinois, an FRA inspector had noted a defect on an inspection report with regard to 49 CFR 217.9 and that he found, through discussion with company officials, that the IAIS did not periodically conduct operational tests and inspections to determine compliance with its operating rules, timetables and special instructions. There was no fine imposed or violation reported at that time, and apparently there was a lack of understanding between FRA and field personnel as to the action to be taken after a defect has been noted on an inspection report. In response to the Safety Board's request as to how this defect was resolved, the FRA, in its January 18, 1989, letter indicated that carrier officials had been admonished to bring the IAIS programs into compliance with the provisions of 49 CFR Part 217.

Although FRA inspectors noted defects on inspection reports in October 1986 that rule books were not available and in September 1987 that the IAIS did not conduct operational tests or inspections, there is no record that the FRA noted any defects on inspection reports that the IAIS failed to install yard limit signs, even though Federal regulations require that yard limit signs be installed and that yard limits be designated in the timetable, train orders, and special instructions. The FRA informed the Safety Board in its January 18, 1989, letter that it has now initiated an enforcement action against the IAIS for violation of Federal regulations pertaining to operating rules. Notwithstanding this enforcement action, the Safety Board concludes that for more than 3 years the FRA failed to exercise its statutory responsibility to oversee adequately railroad operations on the IAIS.

Because of the Safety Board's concern about the FRA's lack of oversight of IAIS operations, the Safety Board believes that the FRA should take immediate action to conduct a safety audit of the operating practices of the IAIS.

The Safety Board is also concerned that the FRA does not have a system in place to determine that defects noted on field inspection reports have been followed up by FRA inspectors to verify that corrective action has been taken by the carrier. Furthermore, while defects noted on inspection reports are entered into a computer data base, there is no formal process for the systematic evaluation of this data base. Given the FRA's reliance on its field personnel to notice trends in a carrier's operations but the lack of communication and coordination between field and headquarters personnel, the Safety Board is concerned that a carrier's noncompliance with Federal regulations is not receiving the attention it needs from top FRA officials.

Accordingly, the Safety Board urges the FRA to take immediate action to implement a program that will (1) provide consistent followup of defects noted on inspection reports to verify that corrective action has been taken, (2) outline in detail the responsibilities of field and headquarters personnel regarding defects and violations noted, and (3) alert FRA officials of a carrier's noncompliance with Federal regulations and of trends in carriers operations.

Existing tank car design specifications in 49 CFR Part 179 do not address accident performance standards, particularly with respect to closure fittings on tank cars, or require that dynamic loads be calculated to determine if a tank car and its fittings can withstand the dynamic forces generated by liquid surging or sloshing in a derailment or overturning. Since calculation of the loading forces on the manways and other closures is not required or done as part of the tank design or approval process, the Safety Board could not determine if the dynamic forces generated in this accident exerted pressures that would have exceeded the rated pressures of the relief valves and the manways, had they been properly secured. Secondly, the performance of the pressure relief valves has been tested only in a vertical position. The performance of these relief valves in positions other than the vertical has not been proven, particularly since one pressure relief valve observed to be leaking in a horizontal position later performed nearly to manufacturer's specifications in a vertical position during the bench tests. The Safety Board believes that in accidents that are survivable by the rail tank, particularly with the small amount of structural damage as seen in this accident, it is reasonable to expect the closure fittings on the rail tank to maintain their integrity as well. Accordingly, the Safety Board urges that the FRA, with the cooperation and assistance of the Research and Special Programs Administration (RSPA), amend 49 CFR Part 179 to require that closure fittings on hazardous materials rail tanks be designed to maintain their integrity in accidents that are typically survivable by the rail tank.

The ability to mount bolted supports for fittings such as pressure relief valves and or to secure bolted fittings such as manway openings to provide a liquid or vapor tight seal depends upon tightening the fastening bolts not just so that they appear secure, but to the proper torque levels. Further, this requires the use of gaskets of the proper dimensions, thickness, and material. Therefore, the Safety Board also urges that the FRA, with the cooperation and assistance of RSPA, amend 49 CFR Part 179 to require that tank car designers and manufacturers determine and provide the specifications to secure closure fittings, such as minimum torque values for sealing bolted closures and gasket specifications.

The covered hopper car behind unit 470 apparently elevated on impact, slipped by the standard type E (nonshelf) coupler and overrode the short hood of the locomotive, completely destroying the cab area. A 1982 study prepared for the FRA concluded that one possible means of mitigating the override problem was to install shelf couplers on locomotives. The Safety Board cannot definitively conclude that had the locomotive been equipped with a shelf coupler the fatalities would have been prevented. However, the Safety Board believes that the FRA should promulgate regulations requiring that

locomotives be equipped with shelf couplers compatible in strength with the main frame sill of the locomotive.

The lack of event recorders on the IAIS locomotives prevented the Safety Board from determining the speed of either train at the time of the accident, whether the trains were being operated according to the operating rules, and, thus, whether the speed of either train contributed to the accident or its severity. The Safety Board's position regarding the use of event recorders in the railroad industry has been well documented in previous accident investigations, through the issuance of safety recommendations to the industry and the FRA, and in comments on Federal rulemaking proposals. The Safety Board continues to believe that event recorders are not only an invaluable investigative tool in determining the cause of accidents and preventing future accidents but a management tool that can be used to monitor compliance with operating rules, particularly speed restrictions.

The Safety Board believes that the Rail Safety Improvement Act of 1988 mandates rules requiring event recorders and that it does not give the FRA freedom to decide whether Federal regulatory intervention on this subject is necessary. The Board is concerned, based on the FRA's past considerations of this issue, that FRA will arbitrarily decide that Federal regulations are not justified or warranted. The Board believes that the intent of Congress is explicit and that the FRA should take immediate action and issue the rulemaking requiring event recorders in the railroad industry.

Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the Federal Railroad Administration:

Conduct a safety audit of the Iowa Interstate Railroad.
(Class II, Priority Action) (R-89-45)

Resolve the status of the signal system on the Iowa Interstate Railroad. (Class II, Priority Action)
(R-89-46)

Develop and implement a program that will (1) provide consistent followup of defects noted on inspection reports to verify that corrective action has been taken, (2) outline in detail the responsibilities of field and headquarters personnel regarding defects and violations noted, and (3) alert FRA officials of carriers' noncompliance with Federal regulations and trends in carriers' operations. (Class II, Priority Action)
(R-89-47)

Assist and cooperate with the Research and Special Programs Administration in amending 49 CFR Part 179 to require that closure fittings on hazardous materials rail tanks be designed to maintain their integrity in accidents that are typically survivable by the rail tank.
(Class II, Priority Action) (R-89-48)

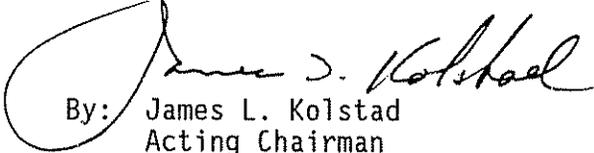
Assist and cooperate with the Research and Special Programs Administration in amending 49 CFR Part 179 to require that specifications for securing closure fittings, such as minimum torque values for sealing bolted closures and gasket specifications, be determined and provided by tank car designers and manufacturers. (Class II, Priority Action) (R-89-49)

Expedite the rulemaking requiring the use of event recorders in the railroad industry. (Class II, Priority Action) (R-89-50)

Promulgate regulations requiring that locomotives be equipped with shelf couplers compatible in strength with the main frame sill of the locomotive. (Class II, Priority Action) (R-89-51)

Also, the Safety Board issued Safety Recommendations R-89-37 through -44 to the Iowa Interstate Railroad; R-89-52 through -54 to the Research and Special Programs Administration; R-89-55 to the Archer Daniels Midland Company; R-89-56 to the Chemical Manufacturers Association and the National Industrial Transportation League; R-89-57 and -58 to the American Short Line Railroad Association; R-89-59 and -60 to the Association of American Railroads; and R-89-61 to the CSX Transportation Company, the Chicago North Western Transportation Company, and METRA. Also, the Safety Board reiterated Safety Recommendation R-87-17 to the Research and Special Programs Administration.

KOLSTAD, Acting Chairman, and BURNETT, LAUBER, NALL, and DICKINSON, Members, concurred in these recommendations.


By: James L. Kolstad
Acting Chairman